

**REMARKS**

In the Official Action mailed 23 August 2007, the Examiner reviewed claims 1-4, 6-11, 13-18 and 20-30. The Examiner has rejected claims 23, 24, 26, 27, 29 and 30 under 35 U.S.C. §112, second paragraph; and has rejected claims 1-4, 6-11, 13-18 and 20-30 under 35 U.S.C. §103(a).

Applicant cancels independent claims 1, 8 and 15, and adds new claims 31-39, including independent claims 31, 34 and 37 to replace canceled independent claims 1, 8, and 15. Amendments to all the pending dependent claims except 3, 10 and 17, are made as a consequence of the new independent claims. Also, applicant cancels claims 22-30. Claims 2-4, 6, 7, 9-11, 13, 14, 16-18, 20-21 and 31-39 are now pending.

The rejections are respectfully traversed below and reconsideration is requested.

**Rejection of Claims 23, 24, 26, 27, 29 and 30 under 35 U.S.C. §112, second paragraph**

The Examiner has rejected claims 23, 24, 26, 27, 29 and 30 under 35 U.S.C. §112, second paragraph. Such claims are canceled.

**Rejection of Claims 1-4, 6-11, 13-18 and 20-30 under 35 U.S.C. §103(a)**

The Examiner has rejected claims 1-4, 6-11, 13-18 and 20-30 under 35 U.S.C. §103(a) as being unpatentable over Perlman (US 6,363,480), and further in view of Kelly (US 5,636,280).

As mentioned above, independent claims 1, 8 and 15 have been replaced by claims 31, 34 and 37 respectively. Applicant requests reconsideration in view of the remarks submitted 23 October 2007, which are incorporated by reference herein. In addition, substantial clarifying amendments have been entered.

**Support for New Claims 31-39**

Support in the specification for new claims 31-39 is found in Figures 1, 2, and 3, and in the specification. Copies of such claims with parenthetical references to support in the specification follow:

31. (new) A method for mutual authentication in communications between first and second stations, comprising:

generating and storing a set of ephemeral session keys at the first station, ephemeral session keys in the set being associated with respective session key initiation intervals, and being discarded at a time later than expiration of the respective session key initiation intervals; (SRKs, Fig. 1)

in response to a request (3005, Fig. 3) to initiate a communication session received by the first station during a particular session key initiation interval, selecting the associated session key (SRKi, Fig. 3);

sending a message carrying said associated session key to the second station (3006, Fig. 3), and receiving a response from the second station including a digital identifier (host ID or user name), which is the digital identifier being information shared between the first station and the second station, or between the first station and a user at the second station, the digital identifier being encrypted using said associated session key to verify receipt of the session key by the second station and to identify the second station or the user of the second station (3007, 3008, Fig. 3);

generating and storing, in the first station, a set of intermediate data keys, the set of intermediate data keys including intermediate data key (i), for i = 1 to at least n, and being discarded at a time later than expiration of the particular session key initiation interval; (DRK1 to DRKn, Fig. 2)

executing a first set of exchanges (3009-3013, Fig. 3) including one or more exchanges with the second station, after verifying in said first station receipt of the session key by the second station by decrypting the digital identifier using the associated session key at the first station and positively matching the decrypted digital identifier against an existing entry in a stored list of authorized users, the first set of exchanges including

sending a message to the second station carrying intermediate data key (i) from said set of intermediate data keys encrypted using the associated session key for a first exchange in first set of exchanges and using the intermediate data key (i-1) for subsequent exchanges in the first set of exchanges,

receiving a response from the second station including a hashed version of intermediate data key (i) encrypted using intermediate data key (i), and decrypting the hashed version of the intermediate data key (i), calculating a hashed version of intermediate data key (i) at the first station, and matching the

calculated hashed version and the received hashed version of intermediate data key (i) to verify receipt by the second station of intermediate data key (i);

executing a second set of exchanges for mutual authentication after verifying in said first station receipt of the intermediate data key (n-1) by the second station, including

sending a first message carrying intermediate data key (n) encrypted using a hashed version of a first shared secret,

receiving a response from the second station carrying a hashed version of intermediate data key (n) encrypted using a hashed version of the first shared secret, and decrypting the hashed version of the intermediate data key (n), calculating a hashed version of intermediate data key (n) at the first station, and matching the calculated hashed version and the decrypted hashed version of intermediate data key (n) to verify possession by the second station of the first shared secret (3014, Fig. 3);

sending a second message carrying intermediate data key (n) encrypted using a hashed version of a second shared secret; and

if the second station sends a response to the second message, carrying a hashed version of intermediate data key (n) encrypted using a hashed version of the second shared secret, after possession by the first station of the second shared secret is verified at the second station, the verifying being accomplished at the second station by decrypting the intermediate data key (n) from the second message using the hashed version of the second shared secret, calculating a hashed version of the intermediate data key (n), and matching the calculated hashed version and the decrypted hashed version of intermediate data key (n) to verify possession by the first station of the second shared secret (3015, Fig. 3), then

receiving the response from the second station, and decrypting the hashed version of the intermediate data key (n) using the hashed version of the second shared secret, calculating a hashed version of intermediate data key (n) at the first station, and matching the calculated hashed version and the decrypted hashed version of intermediate data key (n) at the first station to verify mutual authentication of the first and second stations (3015, Fig. 3); and

if mutual authentication is verified at the first station, then sending a message indicating successful authentication (3016, Fig. 3).

1 32. (new) The method of claim 31, wherein said message indicating successful  
2 authentication carries a signal encrypted using intermediate data key (n-1) or using another  
3 prearranged one of said intermediate data keys (i) (3016, Fig. 3).

1 33. (new) The method of claim 31, including using intermediate data key (n) as a  
2 symmetrical key to encrypt data during post-authentication in-communications between the first  
3 and second stations in the communication session (FSK, paragraph [0051]).

1 34.(new) A data processing apparatus, comprising:  
2 a processor associated with a first station, a communication interface adapted for  
3 connection to a communication medium, and memory storing instructions for execution by the  
4 data processor, the instructions including

5 logic to receive a request via the communication interface for initiation of a  
6 communication session between a first station and a second station;

7 logic to provide for mutual authentication in communications between the first station  
8 and a second station, comprising:

9 generating and storing a set of ephemeral session keys at the first station, ephemeral  
10 session keys in the set being associated with respective session key initiation intervals, and being  
11 discarded at a time later than expiration of the respective session key initiation intervals; (SRKs,  
12 Fig. 1)

13 in response to a request (3005, Fig. 3) to initiate a communication session received by the  
14 first station during a particular session key initiation interval, selecting the associated session key  
15 (SRKi, Fig. 3);

16 sending a message carrying said associated session key to the second station (3006, Fig.  
17 3), and receiving a response from the second station including a digital identifier (host ID or user  
18 name), ~~which is~~ the digital identifier being information shared between the first station and the  
19 second station, or between the first station and a user at the second station, the digital identifier  
20 being encrypted using said associated session key to verify receipt of the session key by the

21 second station and to identify the second station or the user of the second station (3007, 3008,  
22 Fig. 3);

23 generating and storing, in the first station, a set of intermediate data keys, the set of  
24 intermediate data keys including intermediate data key (i), for i = 1 to at least n, and being  
25 discarded at a time later than expiration of the particular session key initiation interval; (DRK1 to  
26 DRKn, Fig. 2)

27 executing a first set of exchanges (3009-3013, Fig. 3) including one or more exchanges  
28 with the second station, after verifying in said first station receipt of the session key by the  
29 second station by decrypting the digital identifier using the associated session key at the first  
30 station and positively matching the decrypted digital identifier against an existing entry in a  
31 stored list of authorized users, the first set of exchanges including

32 sending a message to the second station carrying intermediate data key (i) from said  
33 set of intermediate data keys encrypted using the associated session key for a  
34 first exchange in first set of exchanges and using the intermediate data key (i-  
35 1) for subsequent exchanges in the first set of exchanges,

36 receiving a response from the second station including a hashed version of  
37 intermediate data key (i) encrypted using intermediate data key (i), ~~and~~  
38 decrypting the hashed version of the intermediate data key (i), calculating a  
39 hashed version of intermediate data key (i) at the first station, and matching the  
40 calculated hashed version and the received hashed version of intermediate data  
41 key (i) to verify receipt by the second station of intermediate data key (i);

42 executing a second set of exchanges for mutual authentication after verifying in said first  
43 station receipt of the intermediate data key (n-1) by the second station, including

44 sending a first message carrying intermediate data key (n) encrypted using a hashed  
45 version of a first shared secret,

46 receiving a response from the second station carrying a hashed version of intermediate  
47 data key (n) encrypted using a hashed version of the first shared secret, and  
48 decrypting the hashed version of the intermediate data key (n), calculating a  
49 hashed version of intermediate data key (n) at the first station, and matching  
50 the calculated hashed version and the decrypted hashed version of intermediate

51 data key (n) to verify possession by the second station of the first shared secret  
52 (3014, Fig. 3);  
53 sending a second message carrying intermediate data key (n) encrypted using a hashed  
54 version of a second shared secret; and  
55 if the second station sends a response to the second message, carrying a hashed  
56 version of intermediate data key (n) encrypted using a hashed version of the  
57 second shared secret, after possession by the first station of the second shared  
58 secret is verified at the second station, the verifying being accomplished at the  
59 second station by decrypting the intermediate data key (n) from the second  
60 message using the hashed version of the second shared secret, calculating a  
61 hashed version of the intermediate data key (n), and matching the calculated  
62 hashed version and the decrypted hashed version of intermediate data key (n)  
63 to verify possession by the first station of the second shared secret (3015, Fig.  
64 3), then  
65 receiving the response from the second station, and decrypting the hashed version of  
66 the intermediate data key (n) using the hashed version of the second shared  
67 secret, calculating a hashed version of intermediate data key (n) at the first  
68 station, and matching the calculated hashed version and the decrypted hashed  
69 version of intermediate data key (n) at the first station to verify mutual  
70 authentication of the first and second stations (3015, Fig. 3); and  
71 if mutual authentication is verified at the first station, then sending a message indicating  
72 successful authentication (3016, Fig. 3).

1 35. (new) The apparatus of claim 34, wherein said message indicating successful  
2 authentication carries a signal encrypted using intermediate data key (n-1) or using another  
3 prearranged one of said intermediate data keys (i) (3016, Fig. 3).

1 36. (new) The apparatus of claim 34, including using intermediate data key (n) as a  
2 symmetrical key to encrypt data during post-authentication communications between the first  
3 and second stations in the communication session (FSK, paragraph [0051]).

1        37. (new) An article, comprising:  
2                machine readable data storage medium having computer program instructions stored  
3        therein for establishing a communication session on a communication medium between a first  
4        data processing station and a second data processing station having access to the communication  
5        medium, said instructions comprising  
6                logic to receive a request via the communication interface for initiation of a  
7        communication session between a first station and a second station;  
8                logic to provide for mutual authentication in communications between the first station  
9        and a second station, comprising:  
10                generating and storing a set of ephemeral session keys at the first station, ephemeral  
11        session keys in the set being associated with respective session key initiation intervals, and being  
12        discarded at a time later than expiration of the respective session key initiation intervals; (SRKs,  
13        Fig. 1)  
14                in response to a request (3005, Fig. 3) to initiate a communication session received by the  
15        first station during a particular session key initiation interval, selecting the associated session key  
16        (SRKi, Fig. 3);  
17                sending a message carrying said associated session key to the second station (3006, Fig.  
18        3), and receiving a response from the second station including a digital identifier (host ID or user  
19        name), **which is the digital identifier being information shared between the first station and the**  
20        **second station, or between the first station and a user at the second station, the digital identifier**  
21        **being encrypted using said associated session key to verify receipt of the session key by the**  
22        **second station and to identify the second station or the user of the second station (3007, 3008,**  
23        **Fig. 3);**  
24                generating and storing, in the first station, a set of intermediate data keys, the set of  
25        intermediate data keys including intermediate data key (i), for i = 1 to at least n, and being  
26        discarded at a time later than expiration of the particular session key initiation interval; (DRK1 to  
27        DRKn, Fig. 2)  
28                executing a first set of exchanges (3009-3013, Fig. 3) including one or more exchanges  
29        with the second station, after verifying in said first station receipt of the session key by the  
30        second station by decrypting the digital identifier using the associated session key at the first  
31        station and positively matching the decrypted digital identifier against an existing entry in a

32 stored list of authorized users, the first set of exchanges including  
33 sending a message to the second station carrying intermediate data key (i) from said  
34 set of intermediate data keys encrypted using the associated session key for a  
35 first exchange in first set of exchanges and using the intermediate data key (i-  
36 1) for subsequent exchanges in the first set of exchanges,  
37 receiving a response from the second station including a hashed version of  
38 intermediate data key (i) encrypted using intermediate data key (i), ~~and~~  
39 decrypting the hashed version of the intermediate data key (i), calculating a  
40 hashed version of intermediate data key (i) at the first station, and matching the  
41 calculated hashed version and the received hashed version of intermediate data  
42 key (i) to verify receipt by the second station of intermediate data key (i);  
43 executing a second set of exchanges for mutual authentication after verifying in said first  
44 station receipt of the intermediate data key (n-1) by the second station, including  
45 sending a first message carrying intermediate data key (n) encrypted using a hashed  
46 version of a first shared secret,  
47 receiving a response from the second station carrying a hashed version of intermediate  
48 data key (n) encrypted using a hashed version of the first shared secret, and  
49 decrypting the hashed version of the intermediate data key (n), calculating a  
50 hashed version of intermediate data key (n) at the first station, and matching  
51 the calculated hashed version and the decrypted hashed version of intermediate  
52 data key (n) to verify possession by the second station of the first shared secret  
53 (3014, Fig. 3);  
54 sending a second message carrying intermediate data key (n) encrypted using a hashed  
55 version of a second shared secret; and  
56 if the second station sends a response to the second message, carrying a hashed  
57 version of intermediate data key (n) encrypted using a hashed version of the  
58 second shared secret, after possession by the first station of the second shared  
59 secret is verified at the second station, the verifying being accomplished at the  
60 second station by decrypting the intermediate data key (n) from the second  
61 message using the hashed version of the second shared secret, calculating a  
62 hashed version of the intermediate data key (n), and matching the calculated

63 hashed version and the decrypted hashed version of intermediate data key (n)  
64 to verify possession by the first station of the second shared secret (3015, Fig.  
65 3), then

66 receiving the response from the second station, and decrypting the hashed version of  
67 the intermediate data key (n) using the hashed version of the second shared  
68 secret, calculating a hashed version of intermediate data key (n) at the first  
69 station, and matching the calculated hashed version and the decrypted hashed  
70 version of intermediate data key (n) at the first station to verify mutual  
71 authentication of the first and second stations (3015, Fig. 3); and

72 if mutual authentication is verified at the first station, then sending a message indicating  
73 successful authentication (3016, Fig. 3).

1 38. (new) The apparatus of claim 37, wherein said message indicating successful  
2 authentication carries a signal encrypted using intermediate data key (n-1) or using another  
3 prearranged one of said intermediate data keys (i) (3016, Fig. 3).

1 39. (new) The apparatus of claim 37, including using intermediate data key (n) as a  
2 symmetrical key to encrypt data during post-authentication communications between the first  
3 and second stations in the communication session (FSK, paragraph [0051]).

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**CONCLUSION**

It is respectfully submitted that this application is now in condition for allowance, and such action is requested.

The Commissioner is hereby authorized to charge any fee determined to be due in connection with this communication, or credit any overpayment, to our Deposit Account No. 50-0869 (AIDT 1005-1).

Respectfully submitted,

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